

U.S. Patent Application Serial No. 10/506,671

Amendment filed December 21, 2007

Reply to OA dated September 21, 2007

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 Claim 1 (currently amended): A pipe joint comprising
2 a first and a second tubular joint member of synthetic resin,
3 a synthetic resin gasket interposed between abutting portions of the joint members and screw
4 means for joining the joint members,
5 the pipe joint being characterized in that the first joint member is provided in an abutting end
6 face thereof with an annular recessed portion having an opening remaining therein with the gasket
7 entirely fitted therein,
8 the second joint member being provided with an annular ridge on an abutting end face
9 thereof,
10 the ridge being fitted in the opening of the recessed portion with the gasket fitted in the
11 recessed portion,
12 an outer surface of the ridge of the second joint member being pressed against an inner
13 surface of the recessed portion of the first joint member with the gasket interposed between the

14 surfaces in intimate contact therewith approximately over the entire surface areas when the pipe joint
15 is properly tightened up,

16 a portion of the abutting end face of the first joint member positioned radially inwardly of
17 the recessed portion being then in intimate contact with a portion of the abutting end face of the
18 second joint member positioned radially inwardly of the ridge approximately over the entire surface
19 areas thereof,

20 a portion of the abutting end face of the first joint member positioned radially outwardly of
21 the recessed portion being then in intimate contact with a portion of the abutting end face of the
22 second joint member positioned radially outwardly of the ridge approximately over the entire surface
23 areas thereof,

24 wherein when the pipe joint is manually tightened up, a first gap is present between the
25 portion of the abutting end face of the first joint member positioned radially inwardly of the recessed
26 portion and the portion of the abutting end face of the second joint member positioned radially
27 inwardly of the ridge, and a second gap greater than the first gap is present between the portion of
28 the abutting end face of the first joint member positioned radially outwardly of the recessed portion
29 and the portion of the abutting end face of the second joint member positioned radially outwardly
30 of the ridge,

31 wherein each of the joint members is provided at the abutting end face thereof with a flange
32 portion, and the screw means comprises an annular male screw member having a forward end face
33 in bearing contact with the flange portion of one of the joint members, and a cap nut fitted around

34 the other joint member and having a top wall in bearing contact with the flange portion of said other
35 joint member, the cap nut being screwed on the male screw member.

1 Claim 2 (currently amended): A pipe joint comprising
2 a first and a second tubular joint member of synthetic resin, and screw means for joining the
3 joint members,

4 the pipe joint being characterized in that the first joint member is provided with an annular
5 recessed portion ~~in an abutting end face thereof~~ formed between a portion of an abutting end face
6 positioned radially inwardly and a portion of the abutting end face positioned radially outwardly,

7 the second joint member being provided with an annular ridge on an abutting end face
8 thereof,

9 the ridge of the second joint member being fitted in the recessed portion of the first joint
10 member, with an outer surface of the ridge in intimate contact with an inner surface of the recessed
11 portion approximately over the entire surface areas when the pipe joint is properly tightened up,

12 [[a]] the portion of the abutting end face of the first joint member positioned radially
13 inwardly of the recessed portion being then in intimate contact with a portion of the abutting end face
14 of the second joint member positioned radially inwardly of the ridge approximately over the entire
15 surface areas thereof,

16 [[a]] the portion of the abutting end face of the first joint member positioned radially
17 outwardly of the recessed portion being then in intimate contact with a portion of the abutting end

18 face of the second joint member positioned radially outwardly of the ridge approximately over the
19 entire surface areas thereof,

20 wherein when the pipe joint is manually tightened up, a first gap is present between the
21 portion of the abutting end face of the first joint member positioned radially inwardly of the recessed
22 portion and the portion of the abutting end face of the second joint member positioned radially
23 inwardly of the ridge, and a second gap greater than the first gap is present between the portion of
24 the abutting end face of the first joint member positioned radially outwardly of the recessed portion
25 and the portion of the abutting end face of the second joint member positioned radially outwardly
26 of the ridge,

27 wherein each of the joint members is provided at the abutting end face thereof with a flange
28 portion, and the screw means comprises an annular male screw member having a forward end face
29 in bearing contact with the flange portion of one of the joint members, and a cap nut fitted around
30 the other joint member and having a top wall in bearing contact with the flange portion of said other
31 joint member, the cap nut being screwed on the male screw member.

1 Claim 3 (currently amended): A pipe joint comprising
2 a first and a second tubular joint member of synthetic resin,
3 a synthetic resin gasket interposed between abutting portions of the joint members and screw
4 means for joining the joint members,

5 the pipe joint being characterized in that each of the joint members is provided in an abutting
6 end face thereof with an annular recessed portion for forming a portion for accommodating the
7 gasket therein when the joint members are butted against each other,

8 the gasket being in intimate contact with an inner surface of the recessed portion of the first
9 joint member approximately over the entire area thereof when the pipe joint is properly tightened
10 up,

11 a surface portion of the gasket exposed from the same recessed portion being then in intimate
12 contact with an inner surface of the recessed portion of the second joint member approximately over
13 the entire area thereof,

14 a portion of the abutting end face of the first joint member positioned radially inwardly of
15 the recessed portion thereof being then in intimate contact with a portion of the abutting end face of
16 the second joint member positioned radially inwardly of the recessed portion thereof approximately
17 over the entire surface areas thereof,

18 a portion of the abutting end face of the first joint member positioned radially outwardly of
19 the recessed portion thereof being then in intimate contact with a portion of the abutting end face of
20 the second joint member positioned radially outwardly of the recessed portion thereof approximately
21 over the entire surface areas thereof,

22 wherein when the pipe joint is manually tightened up, a first gap is present between the
23 portion of the abutting end face of the first joint member positioned radially inwardly of the recessed
24 portion thereof and the portion of the abutting end face of the second joint member positioned

25 radially inwardly of the recessed portion thereof, and a second gap greater than the first gap is
26 present between the portion of the abutting end face of the first joint member positioned radially
27 outwardly of the recessed portion thereof and the portion of the abutting end face of the second joint
28 member positioned radially outwardly of the recessed portion thereof,

29 wherein each of the joint members is provided at the abutting end face thereof with a flange
30 portion, and the screw means comprises an annular male screw member having a forward end face
31 in bearing contact with the flange portion of one of the joint members, and a cap nut fitted around
32 the other joint member and having a top wall in bearing contact with the flange portion of said other
33 joint member, the cap nut being screwed on the male screw member.

1 Claim 4 (previously presented): A pipe joint comprising
2 a first and a second tubular joint member of synthetic resin,
3 a synthetic resin gasket interposed between abutting portions of the joint members and screw
4 means for joining the joint members,

5 the pipe joint being characterized in that each of the joint members is provided in an abutting
6 end face thereof with an annular recessed portion for forming a portion for accommodating the
7 gasket therein when the joint members are butted against each other,

8 the gasket being in intimate contact with an inner surface of the recessed portion of the first
9 joint member approximately over the entire area thereof when the pipe joint is properly tightened
10 up,

11 a surface portion of the gasket exposed from the same recessed portion being then in intimate
12 contact with an inner surface of the recessed portion of the second joint member approximately over
13 the entire area thereof,

14 a portion of the abutting end face of the first joint member positioned radially inwardly of
15 the recessed portion thereof being then in intimate contact with a portion of the abutting end face of
16 the second joint member positioned radially inwardly of the recessed portion thereof approximately
17 over the entire surface areas thereof,

18 a portion of the abutting end face of the first joint member positioned radially outwardly of
19 the recessed portion thereof being then in intimate contact with a portion of the abutting end face of
20 the second joint member positioned radially outwardly of the recessed portion thereof approximately
21 over the entire surface areas thereof,

22 characterized in that the portion of the abutting end face of the first joint member positioned
23 radially inwardly of the recessed portion thereof axially projects beyond the radially outward portion
24 thereof,

25 the portion of the abutting end face of the second joint member radially inward of the
26 recessed portion thereof axially projecting beyond the radially outward portion thereof.

1 Claim 5 (previously presented): A pipe joint comprising

2 a first and a second tubular joint member of synthetic resin,

3 a synthetic resin gasket interposed between abutting portions of the joint members and screw
4 means for joining the joint members,

5 the pipe joint being characterized in that each of the joint members is provided in an abutting
6 end face thereof with an annular recessed portion for forming a portion for accommodating the
7 gasket therein when the joint members are butted against each other,

8 the gasket being in intimate contact with an inner surface of the recessed portion of the first
9 joint member approximately over the entire area thereof when the pipe joint is properly tightened
10 up,

11 a surface portion of the gasket exposed from the same recessed portion being then in intimate
12 contact with an inner surface of the recessed portion of the second joint member approximately over
13 the entire area thereof,

14 a portion of the abutting end face of the first joint member positioned radially inwardly of
15 the recessed portion thereof being then in intimate contact with a portion of the abutting end face of
16 the second joint member positioned radially inwardly of the recessed portion thereof approximately
17 over the entire surface areas thereof,

18 a portion of the abutting end face of the first joint member positioned radially outwardly of
19 the recessed portion thereof being then in intimate contact with a portion of the abutting end face of
20 the second joint member positioned radially outwardly of the recessed portion thereof approximately
21 over the entire surface areas thereof,

22 characterized in that the portion of the abutting end face of the first joint member positioned
23 radially inwardly of the recessed portion thereof being flush with the bottom surface of the recessed
24 portion thereof,

25 the radially outward portion of the first joint member axially projecting beyond the bottom
26 surface of the recessed portion thereof,

27 the portion of the abutting end face of the second joint member radially inward of the
28 recessed portion thereof axially projecting beyond the bottom surface of the recessed portion thereof,

29 the radially outward portion of the second joint member being axially recessed from the
30 bottom surface of the recessed portion thereof.

1 Claim 6 (previously presented): A pipe joint comprising
2 a first and a second tubular joint member of synthetic resin,
3 a synthetic resin gasket interposed between abutting portions of the joint members and screw
4 means for joining the joint members,

5 the pipe joint being characterized in that each of the joint members is provided in an abutting
6 end face thereof with an annular recessed portion for forming a portion for accommodating the
7 gasket therein when the joint members are butted against each other, the gasket being in intimate
8 contact with an inner surface of the recessed portion of the first joint member approximately over
9 the entire area thereof when the pipe joint is properly tightened up,

10 a surface portion of the gasket exposed from the same recessed portion being then in intimate
11 contact with an inner surface of the recessed portion of the second joint member approximately over
12 the entire area thereof,

13 a portion of the abutting end face of the first joint member positioned radially inwardly of
14 the recessed portion thereof being then in intimate contact with a portion of the abutting end face of
15 the second joint member positioned radially inwardly of the recessed portion thereof approximately
16 over the entire surface areas thereof,

17 a portion of the abutting end face of the first joint member positioned radially outwardly of
18 the recessed portion thereof being then in intimate contact with a portion of the abutting end face of
19 the second joint member positioned radially outwardly of the recessed portion thereof approximately
20 over the entire surface areas thereof,

21 characterized in that the portion of the abutting end face of the first joint member positioned
22 radially inwardly of the recessed portion thereof is recessed from the bottom surface of the recessed
23 portion thereof,

24 the radially outward portion of the first joint member axially projecting beyond the bottom
25 surface of the recessed portion thereof,

26 the portion of the abutting end face of the second joint member radially inward of the
27 recessed portion thereof axially projecting beyond the bottom surface of the recessed portion thereof,

28 the radially outward portion of the second joint member being axially recessed from the
29 bottom surface of the recessed portion thereof.

Claim 7 (canceled).

1 Claim 8 (previously presented): A pipe joint according to any one of claims 4 to 6 wherein
2 when the pipe joint is manually tightened up, a first gap is present between the portion of the
3 abutting end face of the first joint member positioned radially inwardly of the recessed portion
4 thereof and the portion of the abutting end face of the second joint member positioned radially
5 inwardly of the recessed portion thereof, and a second gap greater than the first gap is present
6 between the portion of the abutting end face of the first joint member positioned radially outwardly
7 of the recessed portion thereof and the portion of the abutting end face of the second joint member
8 positioned radially outwardly of the recessed portion thereof.

1 Claim 9 (currently amended): A pipe joint according to any one of claims ~~[[1]]~~ 4 to 6
2 wherein each of the joint members is provided at the abutting end face thereof with a flange portion,
3 and the screw means comprises an annular male screw member having a forward end face in bearing
4 contact with the flange portion of one of the joint members, and a cap nut fitted around the other
5 joint member and having a top wall in bearing contact with the flange portion of said other joint
6 member, the cap nut being screwed on the male screw member.

1 Claim 10 (previously presented): A pipe joint according to claim 9 wherein
2 at least one of a space between the male screw member and the flange portion of said one
3 joint member and a space between the top wall of the cap nut and the flange portion of said other
4 joint member has disposed therein a biasing member for biasing one of the joint members toward
5 the other joint member.

1 Claim 11 (original): A pipe joint according to claim 9 wherein
2 an annular clearance is formed inside the cap nut around the flange portions of the joint
3 members and has an annular spacer disposed therein, and at least one of a space between the cap nut
4 top wall and the spacer and a space between the male screw member and the spacer has provided
5 therein a biasing member for biasing one of the joint members toward the other joint member.

1 Claim 12 (original): A pipe joint according to claim 9 wherein
2 a synthetic resin thrust ring is interposed between the cap nut top wall and the flange portion
3 of the joint member.

1 Claim 13 (original): A pipe joint according to claim 12 wherein
2 the thrust ring has an outside diameter larger than the inside diameter of the cap nut, and the
3 cap nut has an annular recess formed in an inner periphery thereof for accommodating an outer
4 peripheral edge of the thrust ring.

1 Claim 14 (previously presented): A pipe joint comprising
2 a first and a second tubular joint member of synthetic resin,
3 a synthetic resin gasket interposed between abutting portions of the joint members and screw
4 means for joining the joint members,
5 the pipe joint being characterized in that the first joint member is provided in an abutting end
6 face thereof with an annular recessed portion having an opening remaining therein with the gasket
7 entirely fitted therein,
8 the second joint member being provided with an annular ridge on an abutting end face
9 thereof,
10 the ridge being fitted in the opening of the recessed portion with the gasket fitted in the
11 recessed portion,
12 an outer surface of the ridge of the second joint member being pressed against an inner
13 surface of the recessed portion of the first joint member with the gasket interposed between the
14 surfaces in intimate contact therewith approximately over the entire surface areas when the pipe joint
15 is properly tightened up,
16 a portion of the abutting end face of the first joint member positioned radially inwardly of
17 the recessed portion being then in intimate contact with a portion of the abutting end face of the
18 second joint member positioned radially inwardly of the ridge approximately over the entire surface
19 areas thereof,

20 a portion of the abutting end face of the first joint member positioned radially outwardly of
21 the recessed portion being then in intimate contact with a portion of the abutting end face of the
22 second joint member positioned radially outwardly of the ridge approximately over the entire surface
23 areas thereof,

24 wherein each of the joint members is provided at the abutting end face thereof with a flange
25 portion, and

26 the screw means comprises an annular male screw member having a forward end face in
27 bearing contact with the flange portion of one of the joint members, and a cap nut fitted around the
28 other joint member and having a top wall in bearing contact with the flange portion of said other
29 joint member,

30 the cap nut being screwed on the male screw member.

1 Claim 15 (new): A pipe joint according to one of claims 1 to 3 wherein

2 at least one of a space between the male screw member and the flange portion of said one
3 joint member and a space between the top wall of the cap nut and the flange portion of said other
4 joint member has disposed therein a biasing member for biasing one of the joint members toward
5 the other joint member.

1 Claim 16 (new): A pipe joint according to one of claims 1 and 3 wherein
2 an annular clearance is formed inside the cap nut around the flange portions of the joint
3 members and has an annular spacer disposed therein, and at least one of a space between the cap nut
4 top wall and the spacer and a space between the male screw member and the spacer has provided
5 therein a biasing member for biasing one of the joint members toward the other joint member.

1 Claim 17 (new): A pipe joint according to one of claims 1 to 3 wherein
2 a synthetic resin thrust ring is interposed between the cap nut top wall and the flange portion
3 of the joint member.

1 Claim 18 (new): A pipe joint according to claim 17 wherein
2 the thrust ring has an outside diameter larger than the inside diameter of the cap nut, and the
3 cap nut has an annular recess formed in an inner periphery thereof for accommodating an outer
4 peripheral edge of the thrust ring.

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